

REMARKS

The above newly amended paragraph [041] of the specification overcomes some informalities noted in the specification on file. Namely, the formula $YC_{13}.6H_2O$ has been changed to $YCl_3.6H_2O$. As the originally filed Australian application (pg. 7, ln. 22) recited the formula of $YCl_3.6H_2O$, the undersigned avers that the newly amended paragraph of the specification does not contain any new subject matter.

The Applicant notes that claims 18 and 19 have been withdrawn from further consideration as the Examiner concludes that there is no allowable generic or linking claim. As such, the Applicant respectfully requests the non-elected remain in this application subject to reinstatement, in the event that a generic claim is allowed, on the merits or for possible filing of a divisional application(s).

The drawings are objected to for the reasons noted in the official action. All of the raised drawing objections are believed to be overcome by the requested drawing amendments. The accompanying New Replacement Sheet of the formal drawing incorporates all of the requested drawing amendments. If any further amendment to the drawings is believed necessary, the Examiner is invited to contact the undersigned representative of the Applicant to discuss the same.

Claims 22 and 24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for the reasons noted in the official action. The rejected claims are accordingly amended, by the above claim cancellation and amendment, and the presently pending claims are now believed to particularly point out and distinctly claim the subject matter regarded as the invention, thereby overcoming all of the raised § 112, second paragraph, rejections. The entered claim amendments are directed solely at overcoming the raised indefiniteness rejection(s) and are not directed at distinguishing the present invention from the art of record in this case.

Claims 14-16, 20, 21 and 23 are rejected, under 35 U.S.C. § 102(b), as being anticipated in view of Lee et al. ("Modification of Electrodes in Nanocrystalline Dye-Sensitized TiO₂ Solar Cells" Solar Energy Materials & Solar Cells 65, pages 193-200 (2001)). The Applicant acknowledges and respectfully traverses the raised anticipatory rejection in view of the following remarks.

Before discussing the cited references the Applicant would like to note that the claims of the application relate to a method for manufacturing a nano-particulate electrode for Dye Solar Cells. This method including the steps of: forming a nano-particulate layer on an electrically conductive substrate and electrolytically treating the nano-particulate layer in an electrolyte which contains ions that are chemically different from the nano-particulate layer. Treating the nano-particulate layer electrolytically comprises transferring the chemically different ions into the surface of the nano-particulate layer and applying a dye to the nano-particulate layer.

Turning now to the applied reference, the Applicant asserts that Lee et al. describes a fundamentally different process from that with which the present invention is concerned. The purpose of the process described by Lee et al. is to increase a surface area for dyeing. Lee et al. achieve this by a method in which a layer of titanium dioxide is electrodeposited into a titanium dioxide layer that has previously been applied to the electrode.

In contrast, the purpose of the claims of the present invention is to modify the surface of an electrode to reduce surface defects and to change the Fermi level (or conduction band). This is achieved by claimed method in which ions are injected into the surface of the electrode to form a chemical bond with and alter the natural defect state of the surface to enhance cell voltage, reduce recombination of injected electrons and to provide resistance to UV degradation. According to the claims of the present invention the treatment applied is to the near-surface zone of each particle on the surface of the electrode. As explained at page 4 line

12 of the present application, the ions penetrate the surface "*to a depth of approximately 40 angstroms*". In contrast to the teachings of Lee et al. the claims of the present invention do not apply a cover layer to the electrode as a whole. Furthermore, as claimed, the cations that are injected into the surface are of a material different to that from which the surface is formed.

The effect of the process of the present invention is that photoelectrochemical cells that are produced using the treated electrodes have significantly improved photovoltaic voltage and power, as illustrated in the experimental results shown in the originally filed specification at figure 2, thus improving the commercial viability of photovoltaic cells.

As such the Applicant asserts that the claims of the application are distinct from the teachings of the reference in that Lee et al. fails to teach, describe suggest or even hint at transferring ions *into* the surface of an electrode, and does not teach transferring ions into the surface that are chemically *different* than the material from which the surface is formed.

Claims 17, 25, and 26 are rejected, under 35 U.S.C. § 103(a), as being unpatentable over Lee et al. and further in view of Zangari et al., '826 (U.S. Pub. No. 2002/0145826) with evidence from Sager et al., '920 (US Pat. No. 6,852,920) and Lopatin et al., '633 (U.S. Pat. No. 6,340,633).

Claims 24 is rejected, under 35 U.S.C. § 103(a), as being unpatentable over Lee et al. and further in view of Cohen '947 (US Patent No. 4,142,947) with evidence from Sager et al. '920. The Applicant acknowledges and respectfully traverses the raised obviousness rejection in view of the above amendments and the following remarks.

The Applicant acknowledges that the additional references of Zangari et al. '826, Sager et al. '920, Lopatin et al. '633 and Cohen '947 may arguably relate to the features indicated by the Examiner in the official action. Nevertheless, the Applicant respectfully submits that the combination of the base reference of Lee et al. with this additional art still fails to in any way teach, suggest, disclose or remotely hint at the above distinguishing features of the presently

claimed invention. As such, all of the raised rejections should be withdrawn at this time in view of the above amendments and remarks.

In order to emphasize the above noted distinctions between the presently claimed invention and the applied art, independent claim 14 of this application now recite the steps of "...electrolytically treating the nano-particulate layer in an electrolyte, wherein the electrolyte contains ions chemically *different* to the nano-particulate layer and the electrolytic treatment step comprises transferring the chemically different ions *into* the surface of the nano-particulate layer..." Such features are believed to clearly and patentably distinguish the presently claimed invention from all of the art of record, including the applied art.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejections should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejections or applicability of the Lee et al., Zangari et al. '826, Sager et al. '920, Lopatin et al. '633 and Cohen '947 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

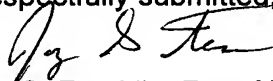
10/583,121

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



Jay S. Franklin, Reg. No. 54,105

Customer No. 020210

Davis & Bujold, P.L.L.C.

112 Pleasant Street

Concord, NH 03301-2931

Telephone 603-226-7490

Facsimile 603-226-7499

E-mail: patent@davisandbujold.com